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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/698,437	10/27/2000	Vivek K. Goyal	7-16-1	6522

7590 04/25/2002

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EXAMINER

HARPER, VINCENT P

ART UNIT

PAPER NUMBER

2654

DATE MAILED: 04/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/698,437

Applicant(s)

GOYAL ET AL.

Examiner

V. Paul Harper

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The references listed in the Information Disclosure Statements dated October 27, 2000 and March 1, 2002 have been considered by the Examiner and are attached to this office action.

Drawings

2. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4, 7, 10, 11, 12, 13, 15, 18, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleming et al. ("Generalized Multiple Descriptive Vector Quantization," Data Compression Conference, sponsored by IEEE

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Computer Society, March, 1999), hereinafter referred to as Fleming, in view of Saleh et al. (U.S. Patent 5,048,057), hereinafter referred to as Saleh.

Regarding claims 1 and 12, Fleming describes a wireless system that uses multiple descriptions during data transmission (abstract, pg. 4, last paragraph), which reads on "a wireless system with a multiple description coder operative to generate a plurality of different descriptions of a given portion of the signal"; Fleming also describes how in a multiple descriptive system designed with two data increments the data increments are broken into packets, where each packet is time-stamped and independently sent (pg. 4, third paragraph, and pg. 5, second paragraph), which reads on "the different descriptions of the given portion of the signal being arranged into packets."

Fleming, however, does not specifically mention that "at least a first description of the given portion is placed in a first packet and a second description of the given portion is placed in a second packet," but an artisan at the time of the invention would have known that the packetized versions of the same portion of data would commonly be time-stamped, as indicated by Fleming, and then inherently sent sequentially with the first version first and the second version second.

In addition, Fleming does not specifically teach the use of a frequency hopping modulator; however, the examiner contends that the concept of a frequency hopping modulator used in a system exhibiting built-in diversity was well known in the art, as taught by Saleh.

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In the same field of endeavor, Saleh describes a wireless local area network that uses a frequency hopping modulator connected to an encoder for channel coding (column 1, line 53, Figure 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Fleming by specifically providing a frequency hopping modulator connected to an encoder, as taught by Saleh, for the purpose recovering lost information with a high probability (column 1, lines 53-56, also Figure 1). The resulting configuration reads on "a frequency hopping modulator having an input coupled to an output of the multiple description coder and operative to configure the packets for transmission."

Additionally, in Saleh's system, the signal points are rearranged for transmission in such a way that information is transmitted over a sequence of predefined "hopping" frequencies in a predefined order and each signal point from each codeword is transmitted on a respective different hopping frequency (column 1, lines 45-65), which reads on "a hopping rate of the modulator is configured based at least in part on a number of descriptions generated for each of a plurality of different portions of the signal."

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Fleming, as taught by Saleh, by specifying a hopping frequency based on the number of descriptions such that lost information can be recovered with a high probability (column 1, lines 54-56).

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Regarding claims 2 and 13, Fleming in view of Saleh disclose everything claimed, as applied above (see claim 1 and 12, respectively), in addition, Fleming discloses research that includes algorithms for the design of multiple description scalar quantizers for data transmission (pg. 6, first paragraph), which reads on "the multiple description coder comprises a multiple description coder configured to implement multiple description scalar quantization (MDSQ)."

Regarding claims 4 and 15, Fleming in view of Saleh disclose everything claimed, as applied above (see claims 1 and 12, respectively), in addition, Fleming discloses that the information to be transmitted is broken into small packets, each of which is time-stamped (pg. 4, paragraph 3), which reads on "each of the portions of the signal correspond to a designated segment of the signal having a particular time duration."

Regarding claims 7 and 18, Fleming in view of Saleh disclose everything claimed, as applied above (see claims 1 and 12, respectively); however, Fleming fails to specifically disclose that the frequency of the hopping modulator is configured such that each of the packets is transmitted using a different frequency. However, the examiner contends that such a use of hopping frequency was well known in the art, as taught by Saleh.

Saleh discloses a system in which information is communicated over a sequence of predefined "hopping" frequencies (column 1, lines 48-50) and a number of sequential codewords are transmitted on a single hopping frequency before transmission proceeds to the next hopping frequency (column 2, lines 3-7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fleming by configuring the frequency hopping modulator such that each of the packets is transmitted using a different frequency, as taught by Saleh, such that lost information can be recovered with a high probability (column 1, lines 55-57).

Regarding claims 10 and 21, Fleming in view of Saleh disclose everything claimed, as applied above (see claims 1 and 12, respectively). Fleming teaches that the information to be transmitted is broken up into a number of small packets (pg. 4, paragraph 3) and that for a two channel description of a signal there would be two data increments (pg. 5, paragraph 2). Fleming, however, does not teach the mixing of descriptions from current and previous portions of the signal. However, the examiner contends that such a mixing of data was well known in the art, as taught by Saleh.

Saleh teaches that information for codewords are made up from a number of signal points rearranged for transmission (column 1, lines 54-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fleming by generating "two descriptions for each of a plurality of different portions of the signal, with a first one of the descriptions for a current one of the portions of the signal being placed in a current packet along with a second one of the descriptions for a previous portion of the signal," as taught by Saleh, so as to reduce the effects of data loss.

Regarding claims 11 and 22, Fleming in view of Saleh disclose everything claimed, as applied above (see claims 1 and 12, respectively). However, Fleming fails

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to specifically disclose that "the hopping rate of the frequency hopping modulator is selected such that a transmission delay of the system is not increased as a result of the transmission of the plurality of descriptions relative to a transmission delay of the system for single description transmission." However, the examiner contends that the relationship between transmission delay and hopping frequency was well known in the art, as taught by Saleh.

Saleh teaches that a number of codewords are transmitted on a single hopping frequency before transmission proceeds to the next hopping frequency since this reduces the rate at which the system needs to switch from one hopping frequency to another (column 2, line 2-7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fleming by adjusting the hopping frequency modulator so as to not introduce delay, as taught by Saleh, and hence maintain the same data transmission rate as in the case of the transmission of a single description.

5. Claims 8, 9, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleming in view of Saleh, and further in view of well known prior art (MPEP 2144.03).

Regarding claims 8 and 19, Fleming in view of Saleh disclose everything claimed, as applied above (see claims 1 and 12, respectively). Fleming in view of Saleh, however, do not specifically disclose that the hopping rate of the frequency hopping modulator is selected as twice a frequency hopping rate of the modulator used for transmission of a single description of the given portion of the signal. However, the

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examiner takes official notice of the fact that it was well known that the hopping frequency would have to double.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Fleming in view of Saleh such that as the number of descriptions doubled the hopping frequency would have to double so as to get each description out at a different frequency and minimize the likelihood of information loss (Saleh, column 1, lines 49-51).

Regarding claims 9 and 20, Fleming in view of Saleh disclose everything claimed, as applied above (see claims 1 and 12, respectively). Fleming in view of Saleh, however, do not specifically disclose that "a packet size for the first and second packets is selected as one-half a packet size used for transmission of a single description of the given portion of the signal." However, the examiner takes official notice of the fact that it was well known that a packet size when two descriptions are used would be one-half the size of the original description.

Therefore, it would have been obvious to one having ordinary skill at the time of the invention to modify Fleming in view of Saleh, such that if a portion of the signal is being divided up and sent out as two descriptions the individual packets would be one-half the size of the original signal, so as to maintain the original overall data rate.

6. Claims 3 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleming in view of Saleh, and further in view of Ingle et al ("DPCM System Design for Diversity Systems With Applications to Packetized Speech," IEEE Transactions on

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Speech and Audio Processing, Vol. 3, No. 1, Jan. 1995), hereinafter referred to as Ingle and further in view of well known prior art (MPEP 2144.03).

Regarding claims 3 and 14, Fleming in view of Saleh disclose everything claimed as applied above (see claims 1 and 12, respectively); however Fleming in view of Saleh do not specifically disclose a multiple descriptive coder that comprises a multiple description adaptive differential pulse code modulation (ADPCM) coder. However, the examiner contends that the concept of using a DPCM (and hence an ADPCM) as a multibit coder was well known in the art, as taught by Ingle.

In the same field of endeavor, Ingle teaches the use of a multi-bit differential pulse-code modulator (DPCM) as a multiple descriptive coder (pg 48, section II, 1st paragraph).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Fleming in view of Saleh by using a DPCM coder, as taught by Ingle, for the purpose of coding the speech in a diversity system to better withstand packet losses (pg 48, section II, 1st paragraph).

Ingle does not specifically teach the use of an ADPCM as a coder; however the examiner takes official notice of the fact that a ADPCM system is a specialized form of a DPCM system.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Fleming in view of Saleh and Ingle to use an ADPCM coder to improve the quality of the quantization at lower data rates.

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7. Claims 5 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleming in view of Saleh, and further in view of Vaishampayan ("Design of Multiple Description Scalar Quantizers," IEEE Transactions on Information Theory, Vol. 39, No. 3, May 1993).

Regarding claims 5 and 16, Fleming in view of Saleh disclose everything as claimed above (see claims 1 and 12, respectively); however, Fleming in view of Saleh do not specifically teach that the signal comprises a speech signal. However, the examiner contends that the concept of using multiple description source codes in applications such as speech was well known in the art, as taught by Vaishampayan.

In the same field of endeavor, Vaishampayan teaches use of multiple description scalar quantizers in applications such as speech over packet-switched networks (pg. 821, column 2, paragraph four).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Fleming in view of Saleh by specifically applying multiple description coding techniques to speech signals, as taught by Vaishampayan, where packet losses can result in the degradation in signal quality.

8. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fleming in view of Saleh, and further in view of well known prior art (MPEP 2144.03).

Regarding claims 6 and 17, Fleming in view of Saleh disclose everything as claimed above (in claims 1 and 12, respectively), in addition, Fleming discloses the use of packet-based communication protocols in wireless systems (pg. 4, paragraph 3);

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however, Fleming fails to specifically disclose that the wireless communications system comprises a cordless telephone system. However, the examiner takes official notice of the fact that the use of wireless technology for a telephone system was well known in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Fleming in view of Saleh such that the wireless communications system included a telephone system, so as to make conversations over a wireless telephone system more reliable.

Citation of Pertinent Art

9. The following prior art made of record but not relied upon is considered pertinent to the applicant's disclosure:

Alamouti et al., "Transmitter Diversity Technique for Wireless Communications,"
U.S. Patent Number 6,185,285

Sherwood, P.G. et al., "Efficient image and channel coding for wireless packet networks," Proceedings of 2000 International Conference on Image Processing, Sept. 2000, pg. 132-135 vol. 2

Yang, Shih-Ming, et al., "Low-Delay Communication for Rayleigh Fading Channels: An Application of the Multiple Description Quantizer," IEEE Transactions on Communications, Vol. 43, No. 11, Nov. 1995, pg. 2771- 2783

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Conclusion

Any response to this office action should be mailed to:

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Crystal Park II
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Sixth Floor (Receptionist)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. V. Paul Harper whose telephone number is (703) 305-4197. The examiner can normally be reached on Monday through Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsh D. Banks-Harold, can be reached on (703) 305-4379. The fax phone number for the Technology Center 2600 is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service office whose telephone number is (703) 306-0377.



MARSHA D. BANKS-HAROLD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

VPH/vph
April 20, 2002